WANDBOARD.ORG

WANDBOARD USER GUIDE

(20130208)

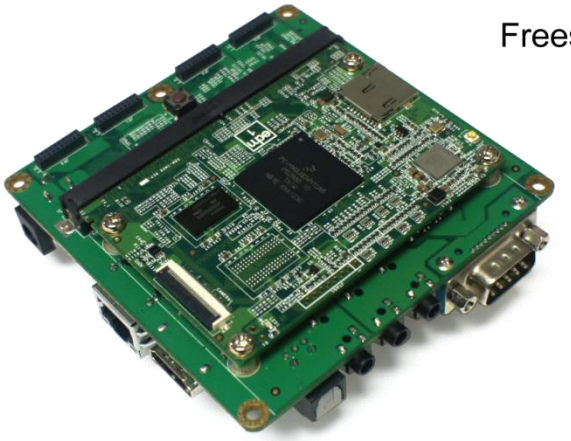
WANDBOARD DESIGN AND DISCLAIMER

These design materials referred to in this document are *NOT SUPPORTED* and DO NOT constitute a reference design. Only "community" support is allowed via resources at Wandboard.org forums.

THERE IS NO WARRANTY FOR THE DESIGN MATERIALS, TO THE EXTENT PERMITTED BY APPLICABLE LAW. EXCEPT WHEN OTHERWISE STATED IN WRITING THE COPYRIGHT HOLDERS AND/OR OTHER PARTIES PROVIDE THE DESIGN MATERIALS "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THE ENTIRE RISK AS TO THE QUALITY AND PERFORMANCE OF THE DESIGN MATERIALS IS WITH YOU. SHOULD THE DESIGN MATERIALS PROVE DEFECTIVE, YOU ASSUME THE COST OF ALL NECESSARY SERVICING, REPAIR OR CORRECTION.

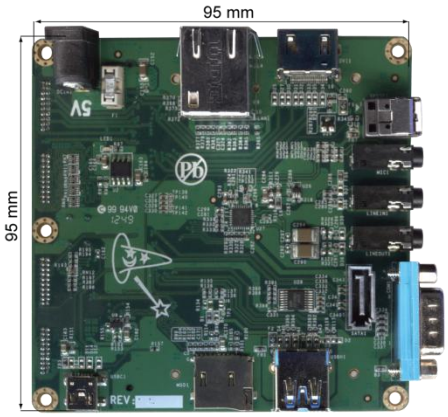
This board was designed as an evaluation and development tool. It was not designed with any other application in mind. As such, these design materials may or may not be suitable for any other purposes. If used, the design material becomes your responsibility as to whether or not it meets your specific needs or your specific applications and may require changes to meet your requirements.

WANDBOARD.ORG



Freescale i.MX6 Cortex-A9
Low cost open source community
Development Board

Dimensional drawing

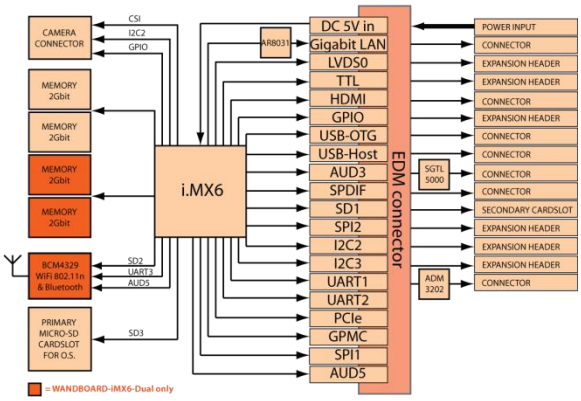


Specifications

	Wandboard Solo	Wandboard Dual
Processor	i.MX6 Solo	i.MX6 DualLite
Cores	ARM Cortex-A9	ARM Cortex-A9
	Single core @ 1GHz	Dual core @ 1GHz
Memory	512 MB DDR3	1 GB DDR3
Audio	✓	✓
Optical S/PDIF	✓	✓
HDMI	✓	✓
Camera interface	✓	✓
micro SD cardslot	2	2
Serial port	✓	✓
Expansion Header	✓	✓
USB	✓	✓
USB OTG	✓	✓
SATA connector	Not populated	Not populated
Gigabit LAN	✓	✓
WIFI (802.11n)	X	✓
Bluetooth	X	✓

Complete Schematics, Source Code and Documentation can be found on www.wandboard.org

Block diagram

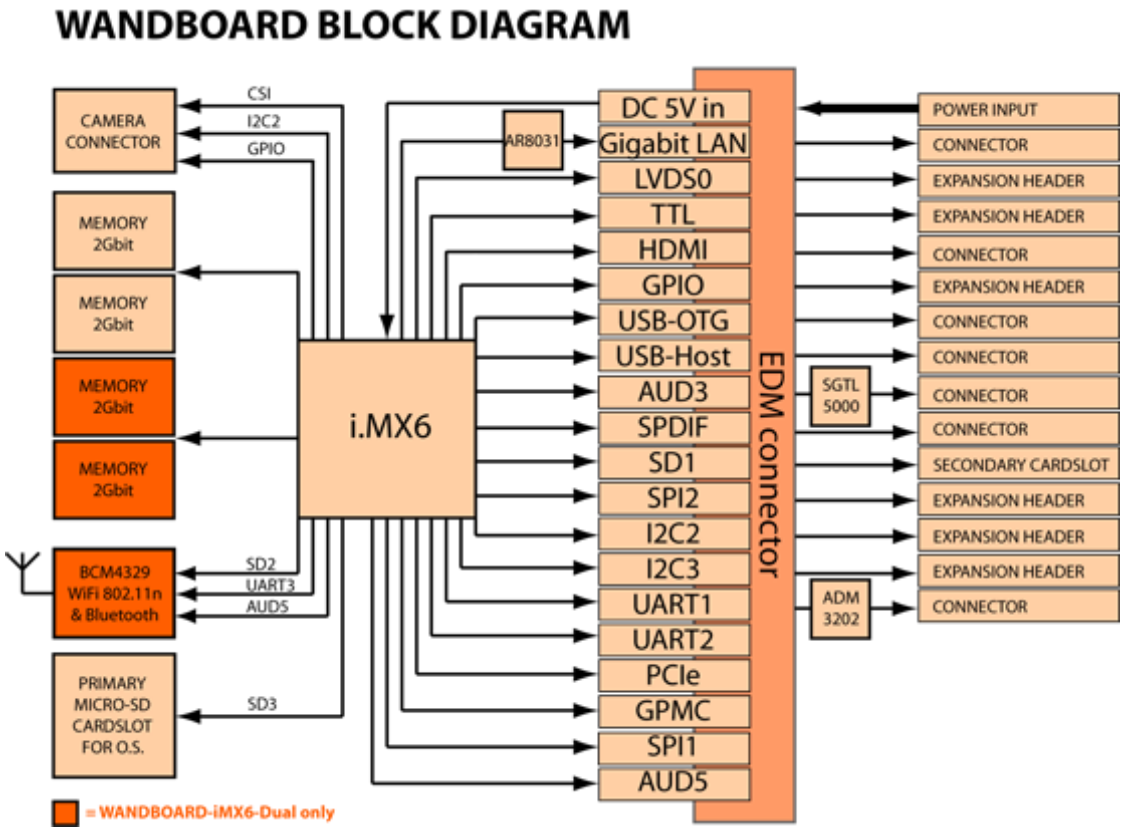


Order information

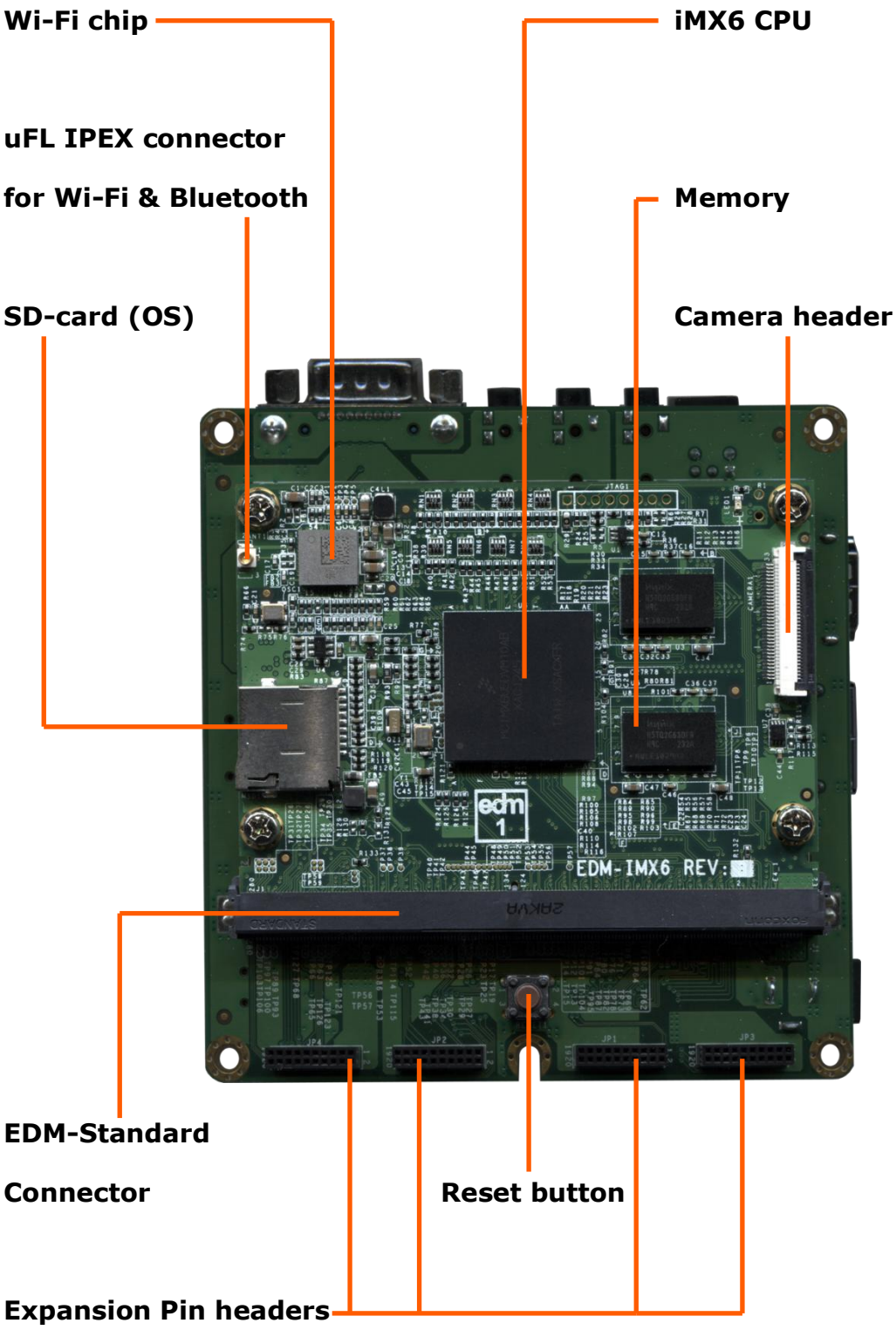
Wandboard Solo
Wandboard Dual
Accessory

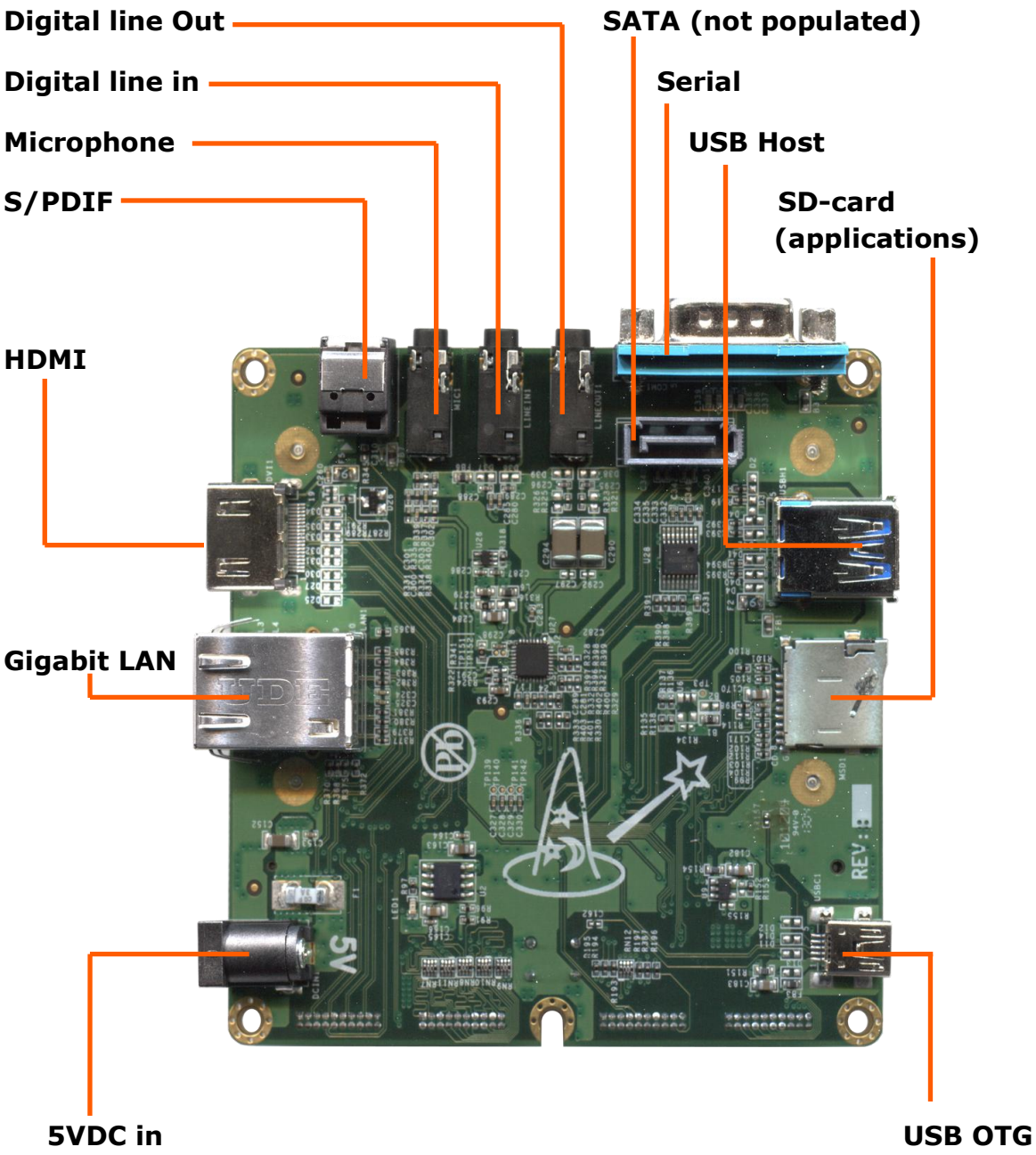
i.MX6 Solo
i.MX6 DualLite
Enclosure

Block Diagram

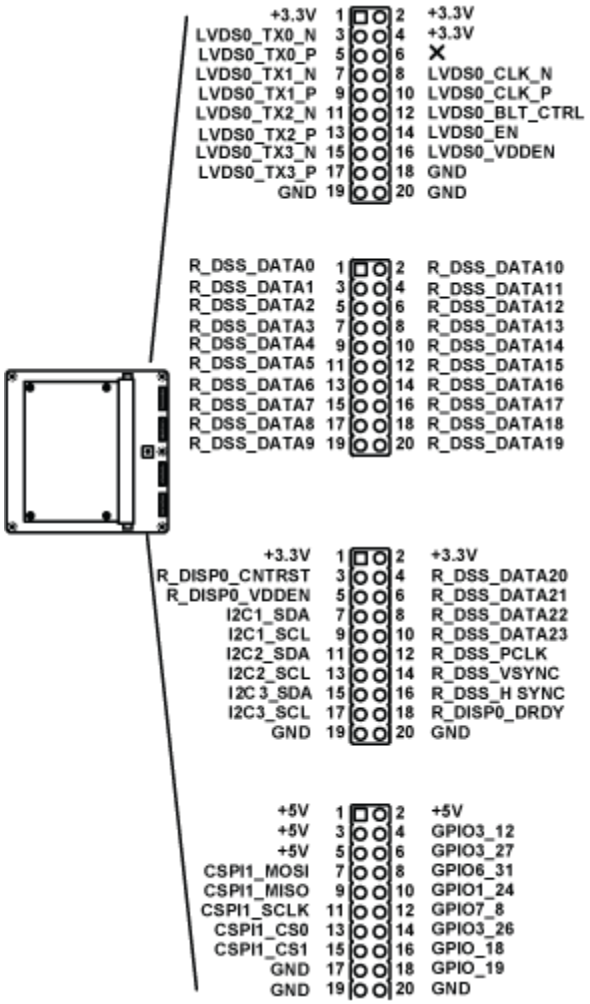


Overview

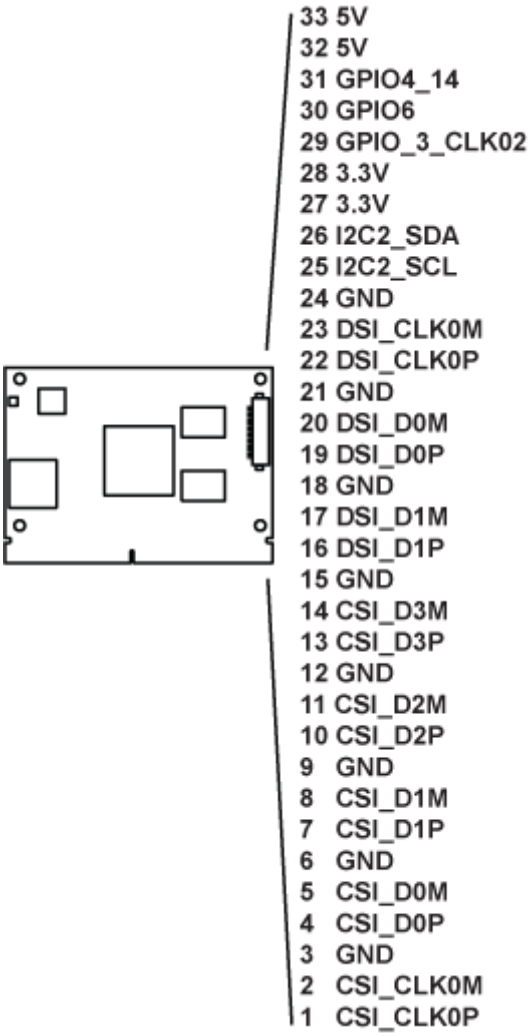

Wi-Fi chip
iMX6 CPU
uFL IPEX connector
for Wi-Fi & Bluetooth
Memory
SD-card (OS)
Camera header
EDM-Standard
Connector
Reset button
Expansion Pin headers
EDM-IMX6 REV:


Digital line Out
Digital line in
Microphone
S/PDIF
HDMI
Gigabit LAN
5VDC in
SATA (not populated)
Serial
USB Host
SD-card
(applications)
USB OTG

Expansion pin headers



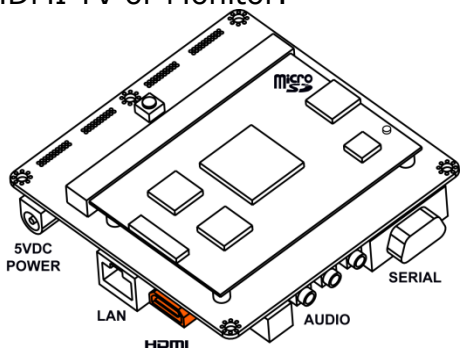
Camera header



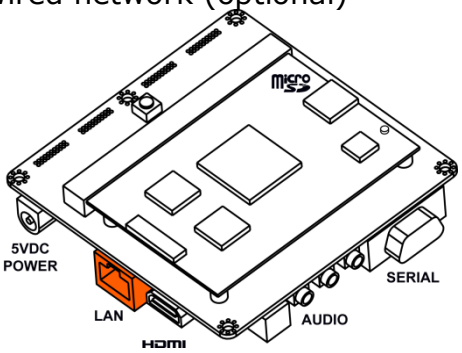
WANDBOARD.ORG

Quick Start Guide

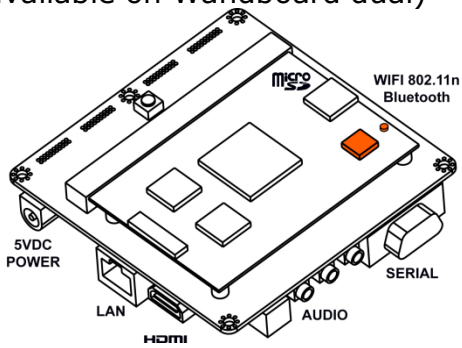
a) Connect display: use a quality HDMI cable to connect to your HDMI TV or Monitor.



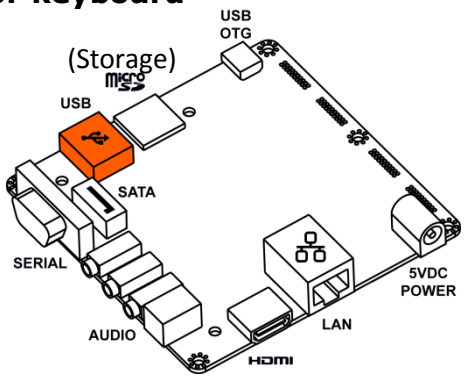
b) Connect network: use a standard RJ45 LAN cable to connect your wired network (optional)



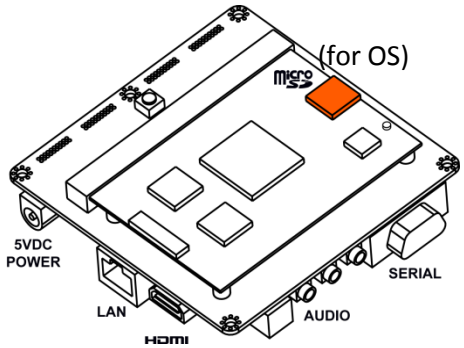
c) Connect wireless antenna (sold separately). This option is only available on Wandboard dual)



d) Connect a standard USB mouse or keyboard

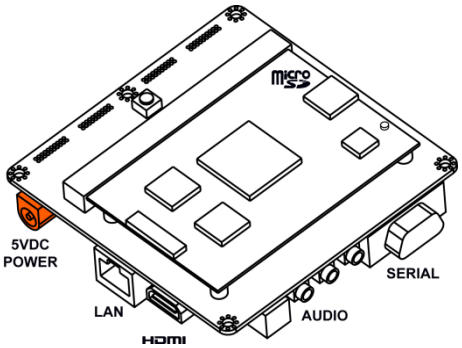


e) Insert the microSD (orange microSD card slot)



Read the last 2 pages of this document to create a microSD card containing the Operating System.

f) Power up: Plug in a power supply (**5 VDC at 2A** is recommended)



Preparing the bootable microSD card for your Wandboard

The microSD card that is created below will contain the Wandboard operating system. A large number of demo runtime images are available.

1. Procedures to get you started

a) Download your preferred Wandboard runtime image
http://www.wandboard.org/index.php/downloads
b) Extract the file that you just downloaded
- Right click on the file and choose "Extract all".
- The extracted files will contain a file ending in *.img*

2. Instructions for Linux users

This paragraph explains how to create a SD card using Linux desktop or notebook. The SD card can be made using a standard terminal.

```
# dd if=*.img of=/dev/sdd bs=1M
```

replace *.img with the full name of the SD card image and replace /dev/sdd with your SD card device".

3. Instructions for Windows users

This paragraph explains how to create a SD card using Windows desktop or notebook.

Note: the *.img* file can only be written to your microSD card by special disk imaging software. This disk imaging software is included in the downloads at wandboard.org or can be downloaded according the instructions in paragraph 3.1.

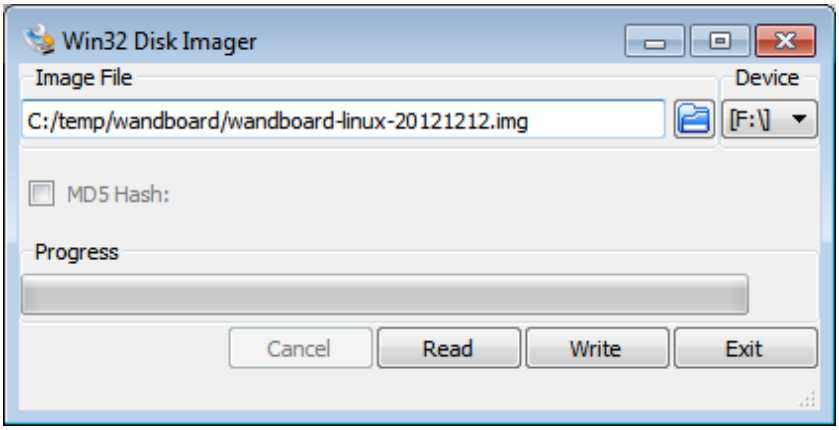
3.1 Download the Win32DiskImager software

a) Download *win32diskimager-binary.zip* from:
http://sourceforge.net/projects/win32diskimager/
b) Right click on the file and choose "Extract all".
c) This will create a new folder called *win32diskimager-binary*

You are now ready to write the Wandboard runtime image to your microSD card.

3.2 Writing the image to the microSD card

a) Insert your microSD card into your PC (Check which drive is assigned to your device).
b) In the folder you made in step 3.1(c), run the file named *Win32DiskImager.exe* (in Windows Vista, 7 and 8 we recommend that you right-click this file and choose "Run as administrator").
c) If the SD card (*Device*) you are using isn't found automatically. Click on the drop down box and select it
d) In the *Image File* box, choose the *.img* file that you download previously

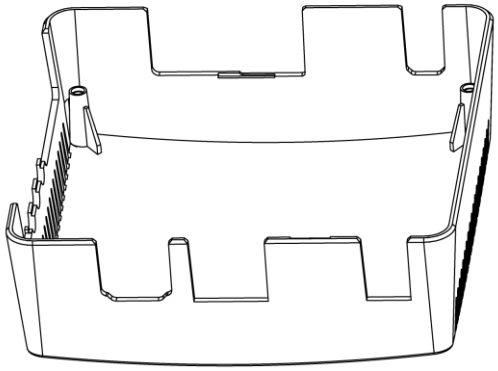


Warning: Make sure you write to the correct device. (check step 3.2a)

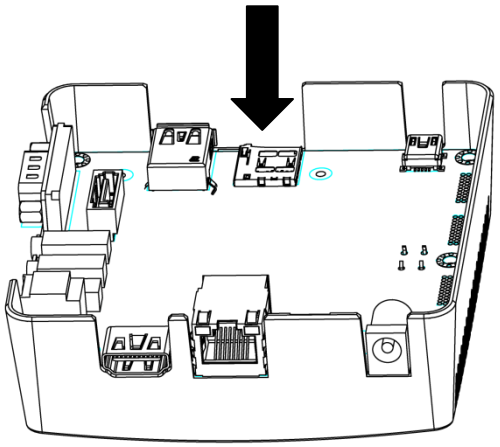
e) Click *Write*
f) After a few minutes you receive a notification that your microSD has been created successfully.

WANDBOARD.ORG

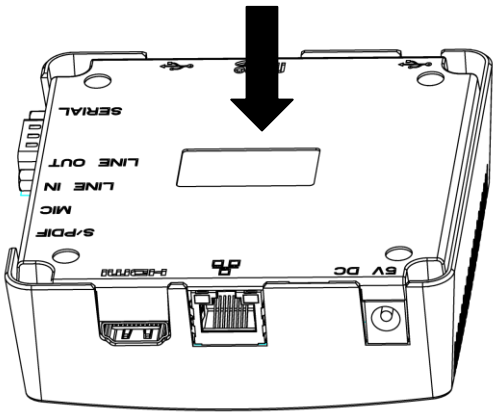
Assembly of the Wandboard Enclosure



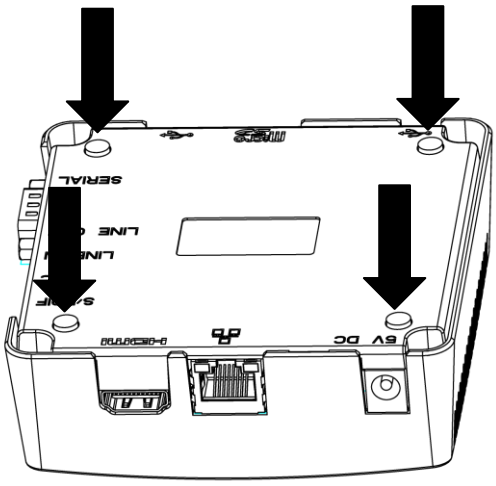
Step1 - Place the top-case on a soft surface



Step2 - Insert your Wandboard



Step3 - Insert bottom part



Step4 - Fasten the screws and the rubber feet

Schematics

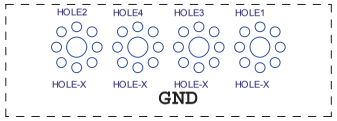
On the following pages you will find the schematics of the Freescale iMX6 module and the Wandboard Interface Board.

Components marked with -x are not populated.

EDM-iMX6 REV:A

PAGE	TITLE
P01	Index
P02	iMX6_POWER
P03	iMX6_DDR3
P04	iMX6_SOC
P05	iMX6_USB
P06	GiGa Ethernet
P07	WLAN & BT
P08	Expansion CONN.

FM9 FM40S-X FM2 FM40S-X FM13 FM40S-X FM8 FM40S-X FM11 FM40S-X FM7 FM40S-X FM6 FM40S-X FM5 FM40S-X FM12 FM40S-X FM3 FM40S-X FM10 FM40S-X FM1 FM40S-X FM4 FM40S-X



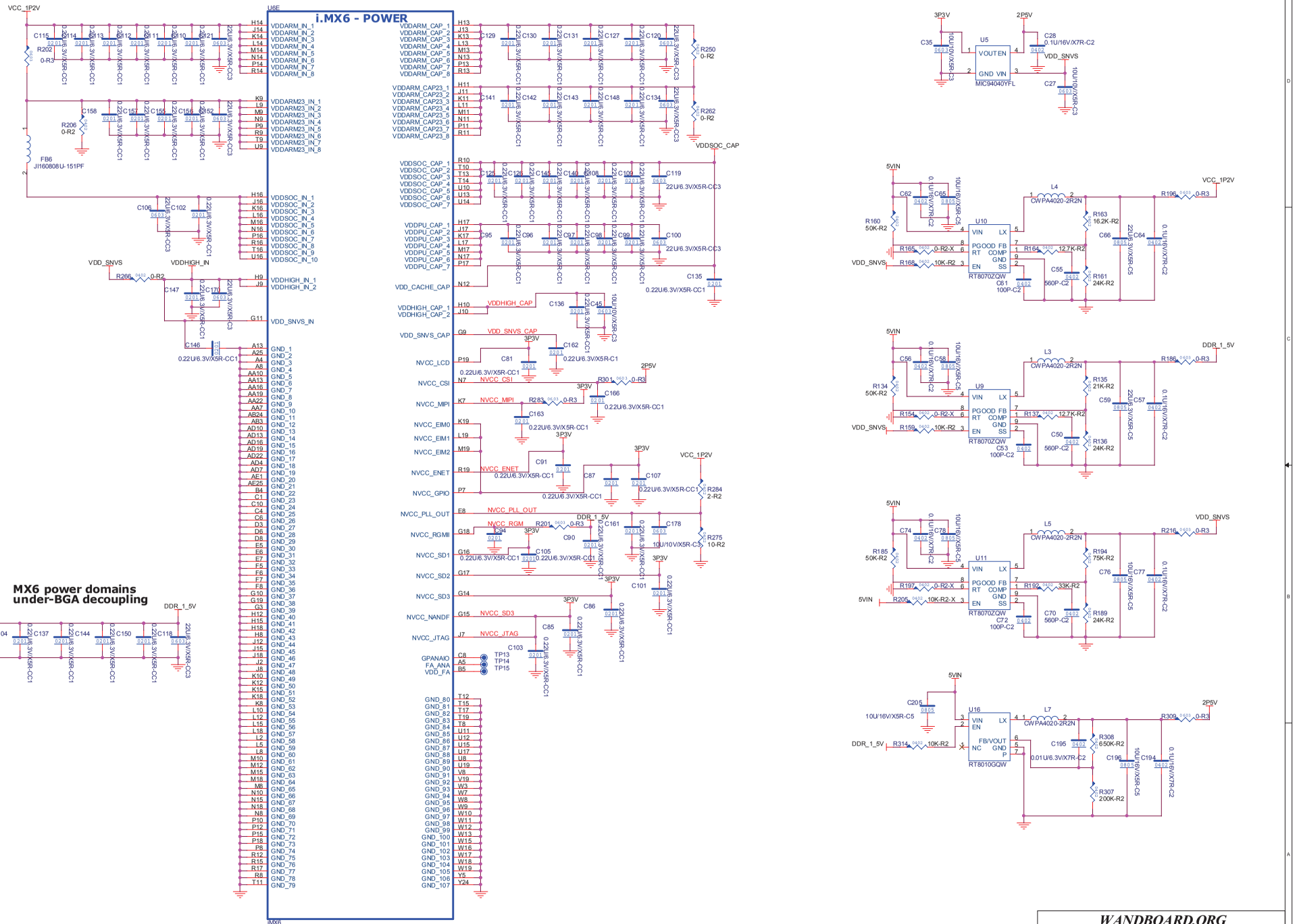
RoHS compliant

WANDBOARD.ORG

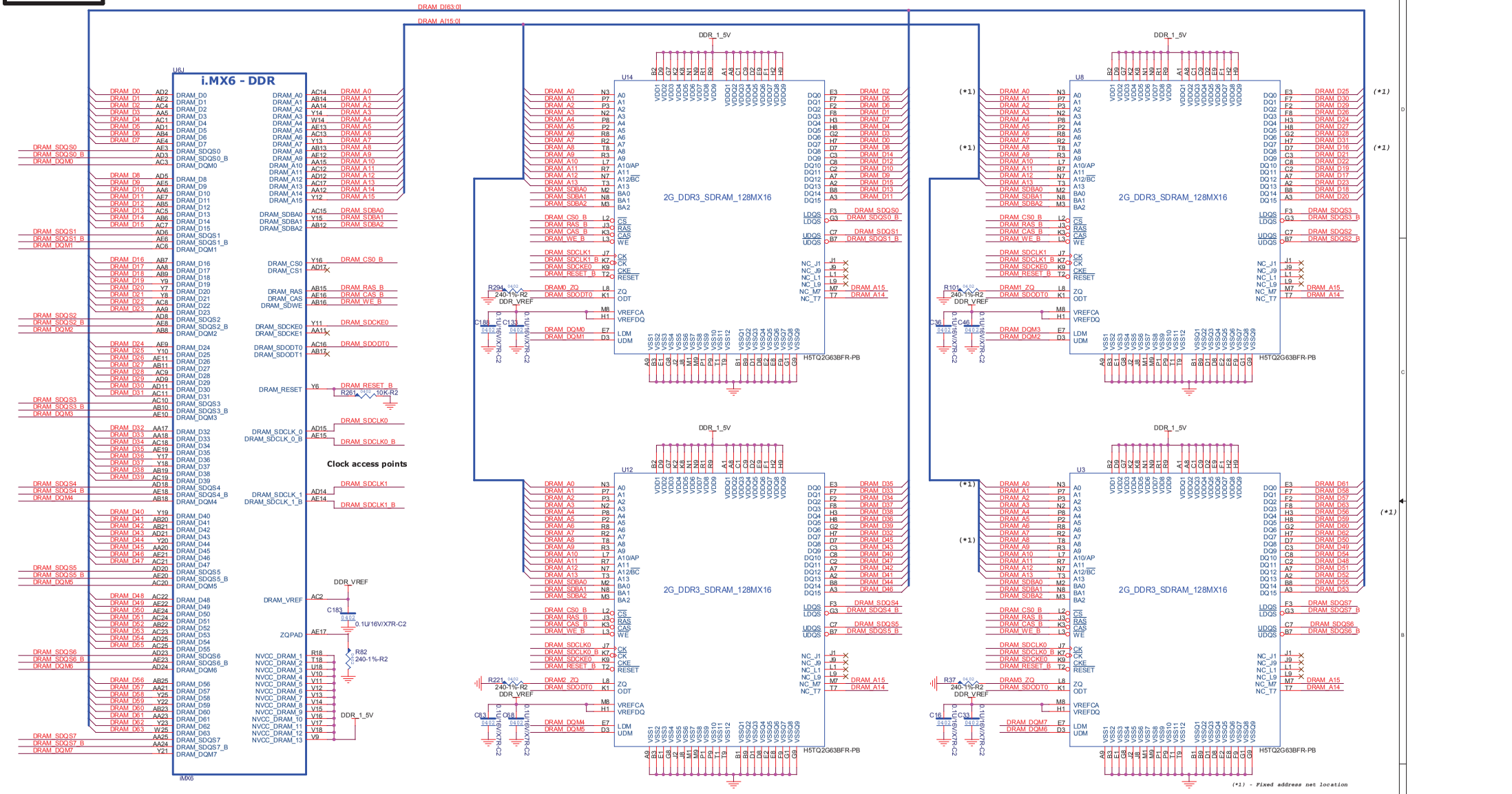
Title: *Index*

Size	Document Number	Rev
C	EDM-iMX6	A

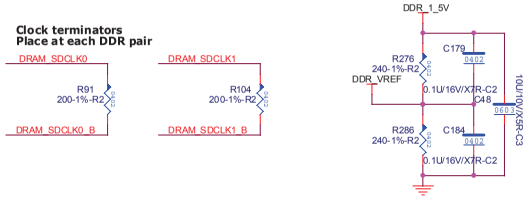
Date: Thursday, February 07, 2013 Sheet 1 of 8

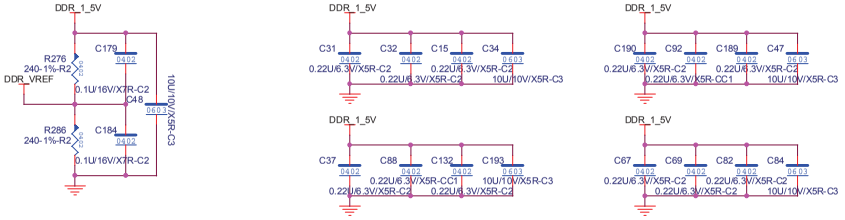

i.MX6 - POWER
MX6 power domains
under-BGA decoupling
VCC_1P2V
VDD_SNVS
VDDHIGH_IN
DDR_1_5V
VDDSOC_CAP
3P3V
2P5V
5VIN
VDD_SNVS
DDR_1_5V
WANDBOARD.ORG
COU POWER DOMAIN
EDM-iMX6
Thursday, February 07, 2013
Sheet 2 of 8

DDR3 2GB

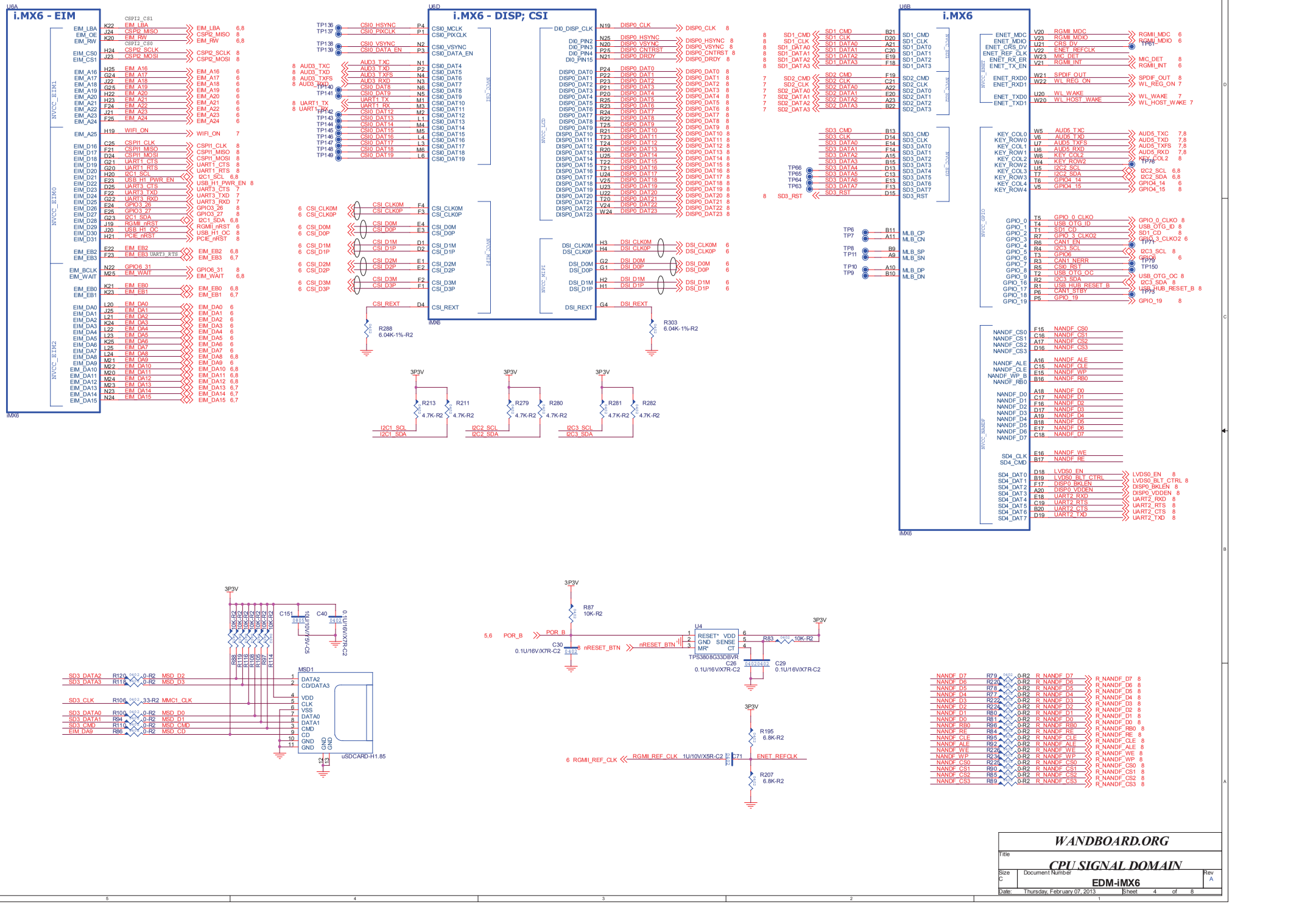


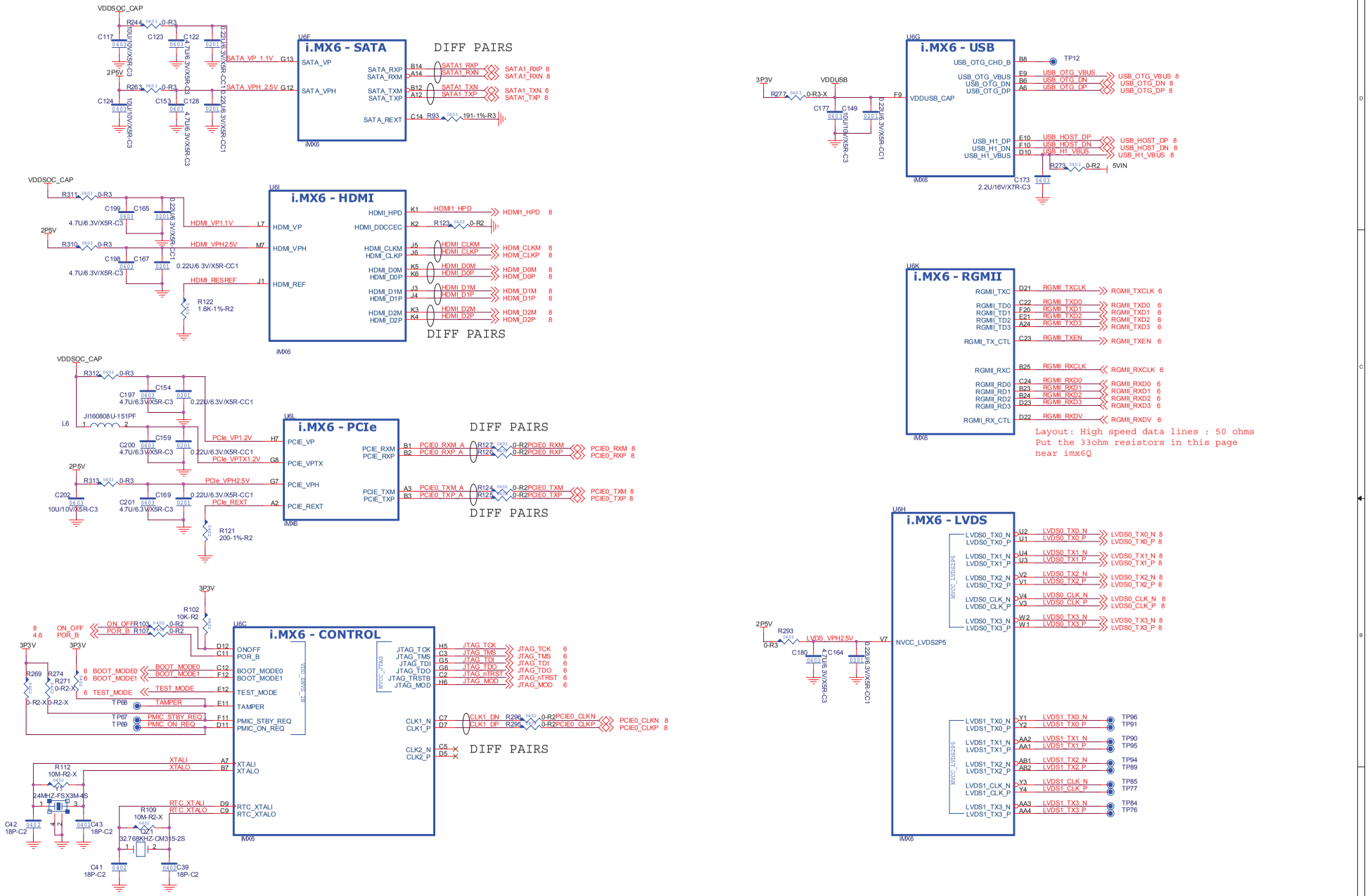
Clock terminators
Place at each DDR pair





WANDBOARD.ORG			
Title: CPU SIGNAL DOMAIN			
Size: C	Document Number: EDM-iMX6		Rev: A
Date: Thursday, February 07, 2013	Sheet 3 of 8		


U6A
i.MX6 - EIM
NVCC_EIM1
NVCC_EIM0
NVCC_EIM2
iMX6
U6D
i.MX6 - DISP; CSI
NVCC_CSI
NVCC_LCD
NVCC_MLFE
iMX6
U6B
i.MX6
NVCC_ENET
NVCC_SD3
NVCC_GPIO
NVCC_NANDF
iMX6
R288
6.04K-1%-R2
R303
6.04K- 1%-R2
3P3V
R213
4.7K-R2
R211
4.7K-R2
R279
4.7K-R2
R280
4.7K-R2
R281
4.7K-R2
R282
4.7K-R2
I2C1_SCL
I2C1_SDA
I2C2_SCL
I2C2_SDA
I2C3_SCL
I2C3_SDA
MSD1
uSDCARD-H1.85
R87
10K-R2
POR_B
U4
TPS3808G33DBVR
nRESET_BTN
R83
10K-R2
C29
0.1U/16V/X7R-C2
C26
0.1U/16V/X7R-C2
R195
6.8K-R2
R207
6.8K-R2
ENET_REFCLK
RGMII_REF_CLK
WANDBOARD.ORG
CPU SIGNAL DOMAIN
EDM-iMX6
Size C
Rev A
Date: Thursday, February 07, 2013
Sheet 4 of 8



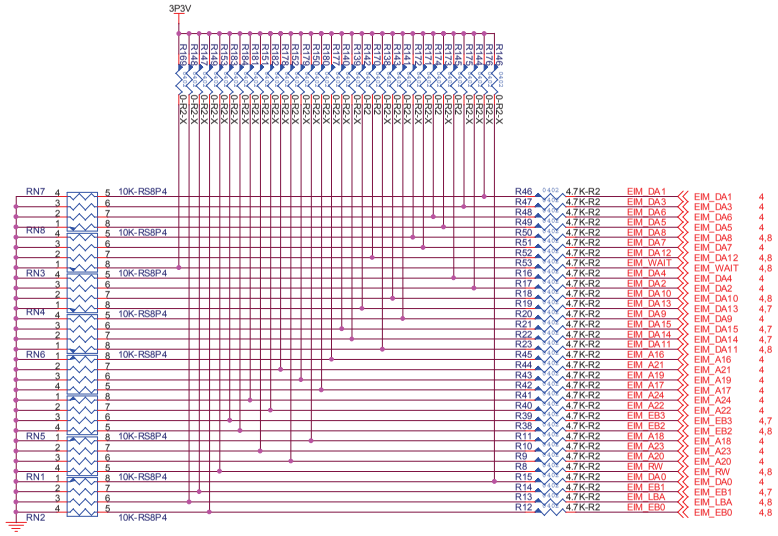
WANDBOARD.ORG

Title: IMX6Q_LVDS/USB

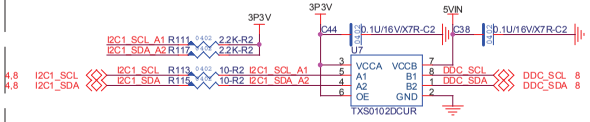
Size	Document Number	Rev
C	EDM-iMX6	A

Date: Thursday, February 07, 2013 Sheet 5 of 8

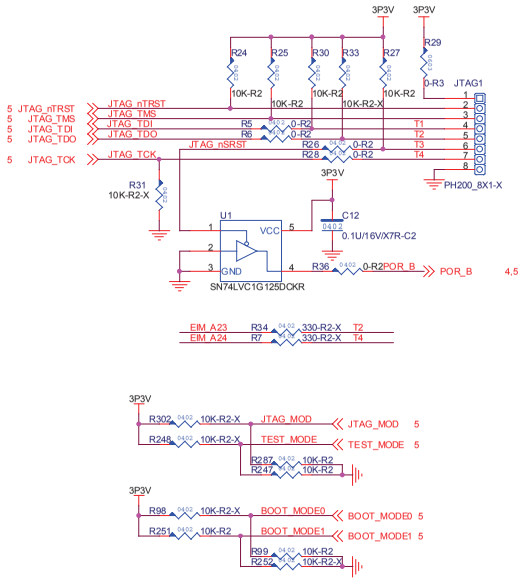
Boot Config Select



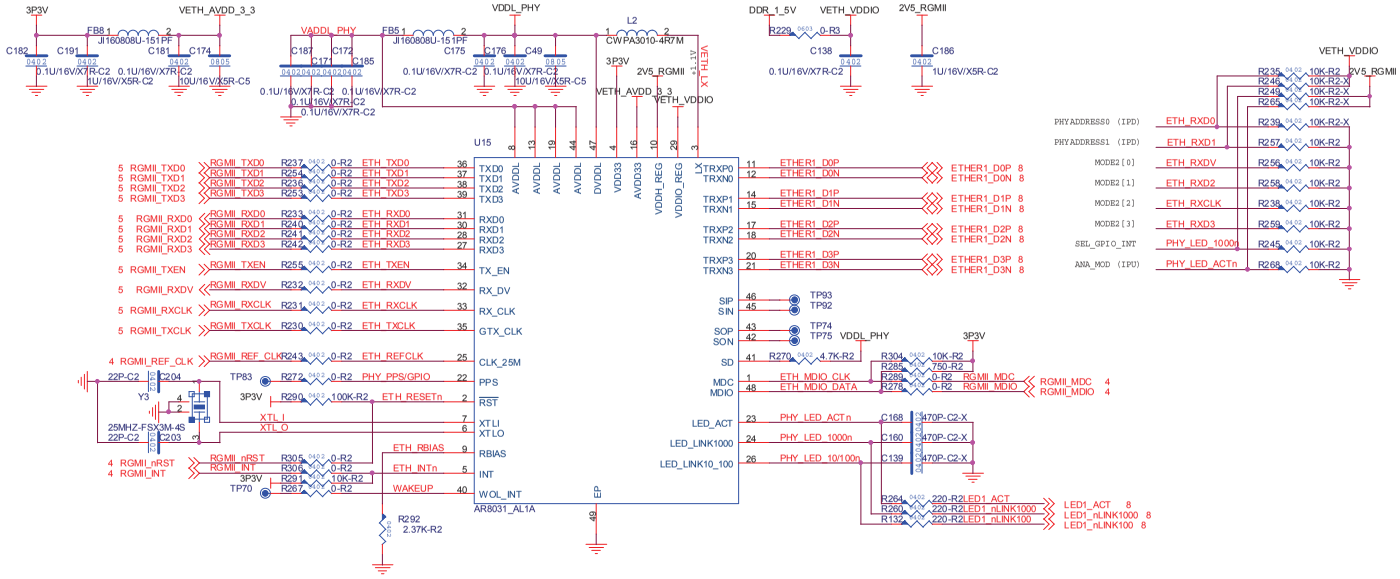
JTAG



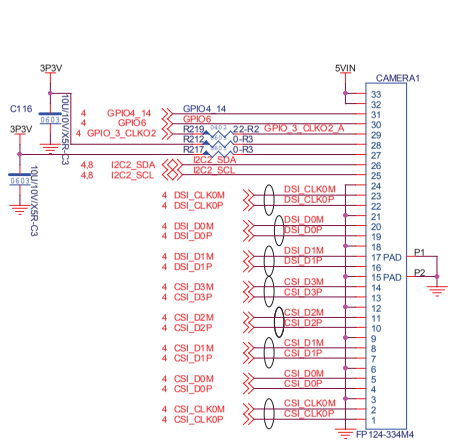
JTAG



Ethernet

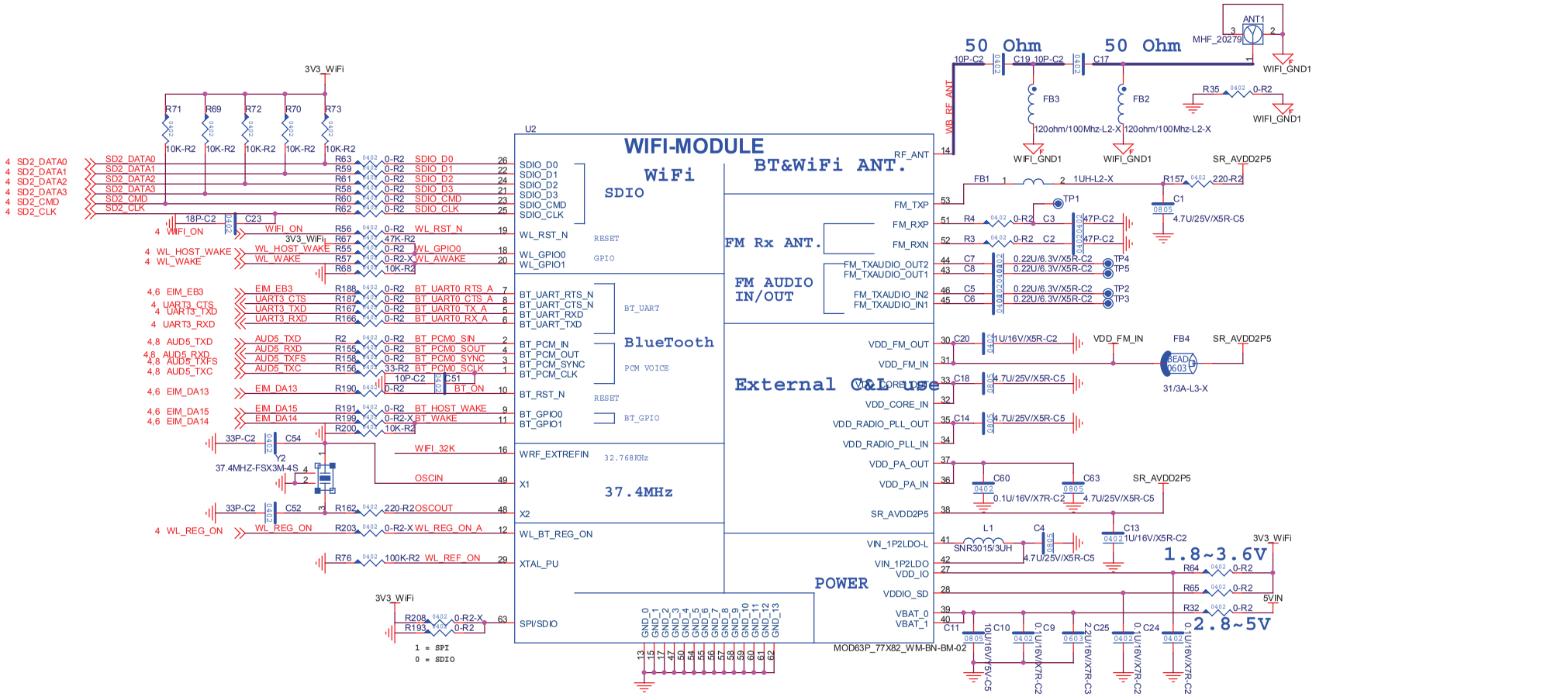


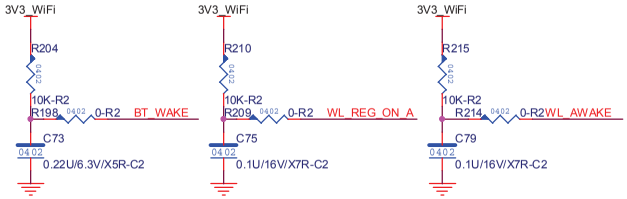
CAMERA

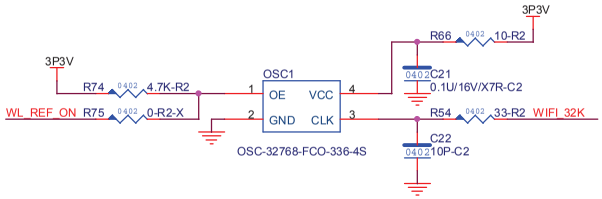


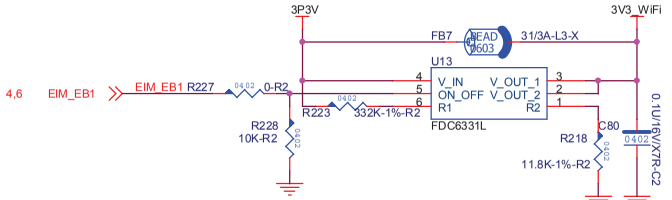
WANDBOARD.ORG	
Title	DIAGNOSTIC
Size C	Document Number EDM-iMX6 Rev A
Date: Thursday, February 07, 2013	Sheet 6 of 8

WIFI+BT



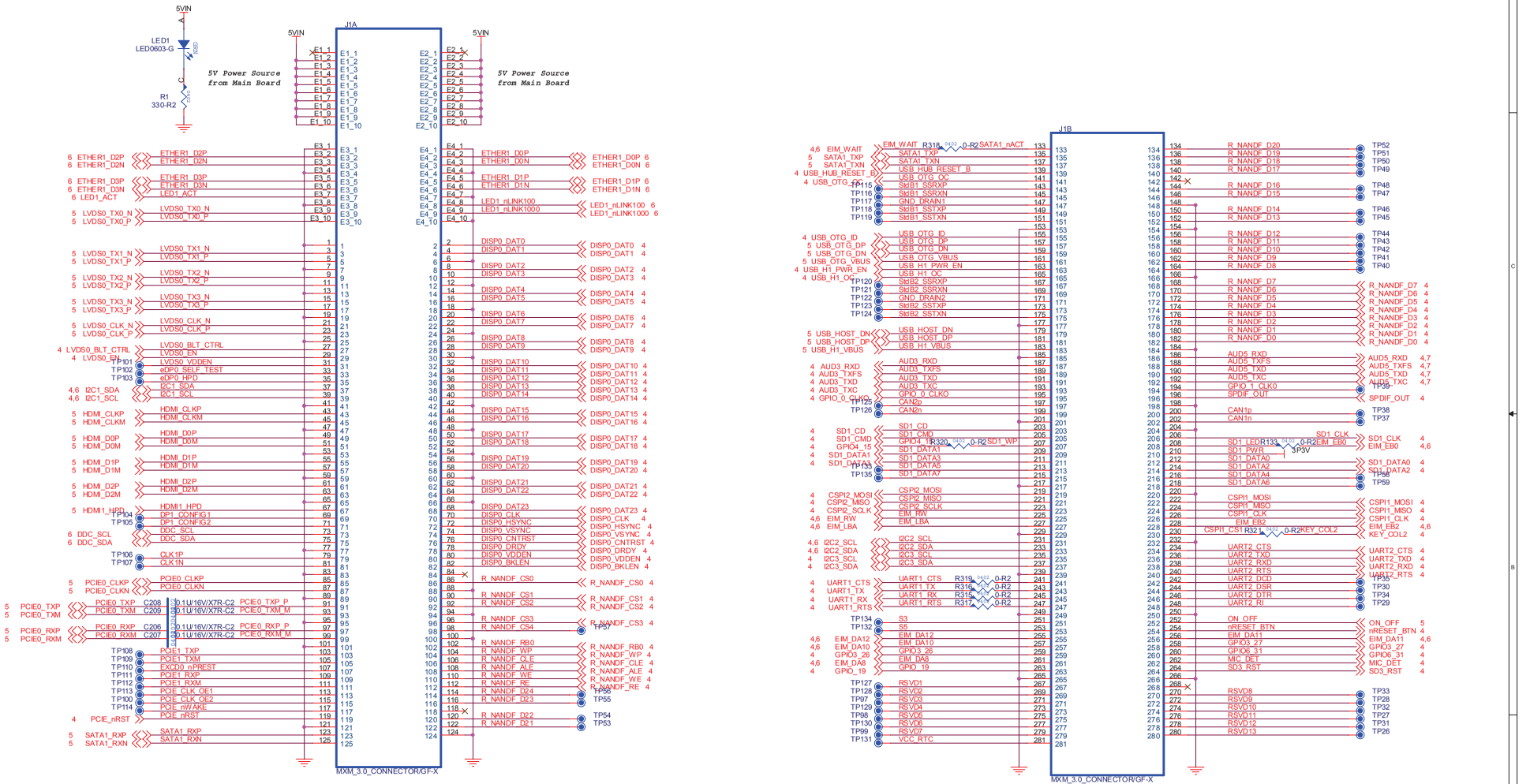






WANDBOARD.ORG		
Title: WIFI-MODULE		
Size: Custom	Document Number: EDM-iMX6	Rev: A
Date: Thursday, February 07, 2013	Sheet 7 of 8	

Board to Board



WANDBOARD.ORG			
Title: BLOCK DIAGRAM			
Size: C	Document Number: EDM-iMX6		Rev: A
Date: Thursday, February 07, 2013	Sheet 8 of 8		

WAND REV:A

PAGE TITLE

P01 Index

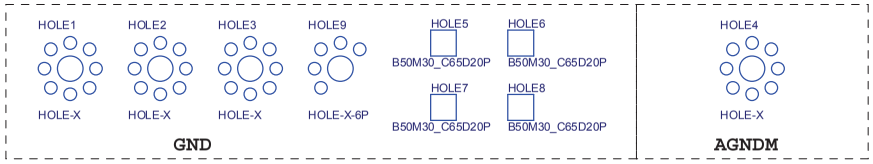
P02 Expansion CONN.

P03 DC-DC & M-SD

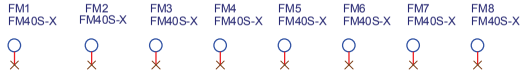
P04 HOST & Client

P05 Audio & RJ45

P06 LVDS & HDMI & SATA

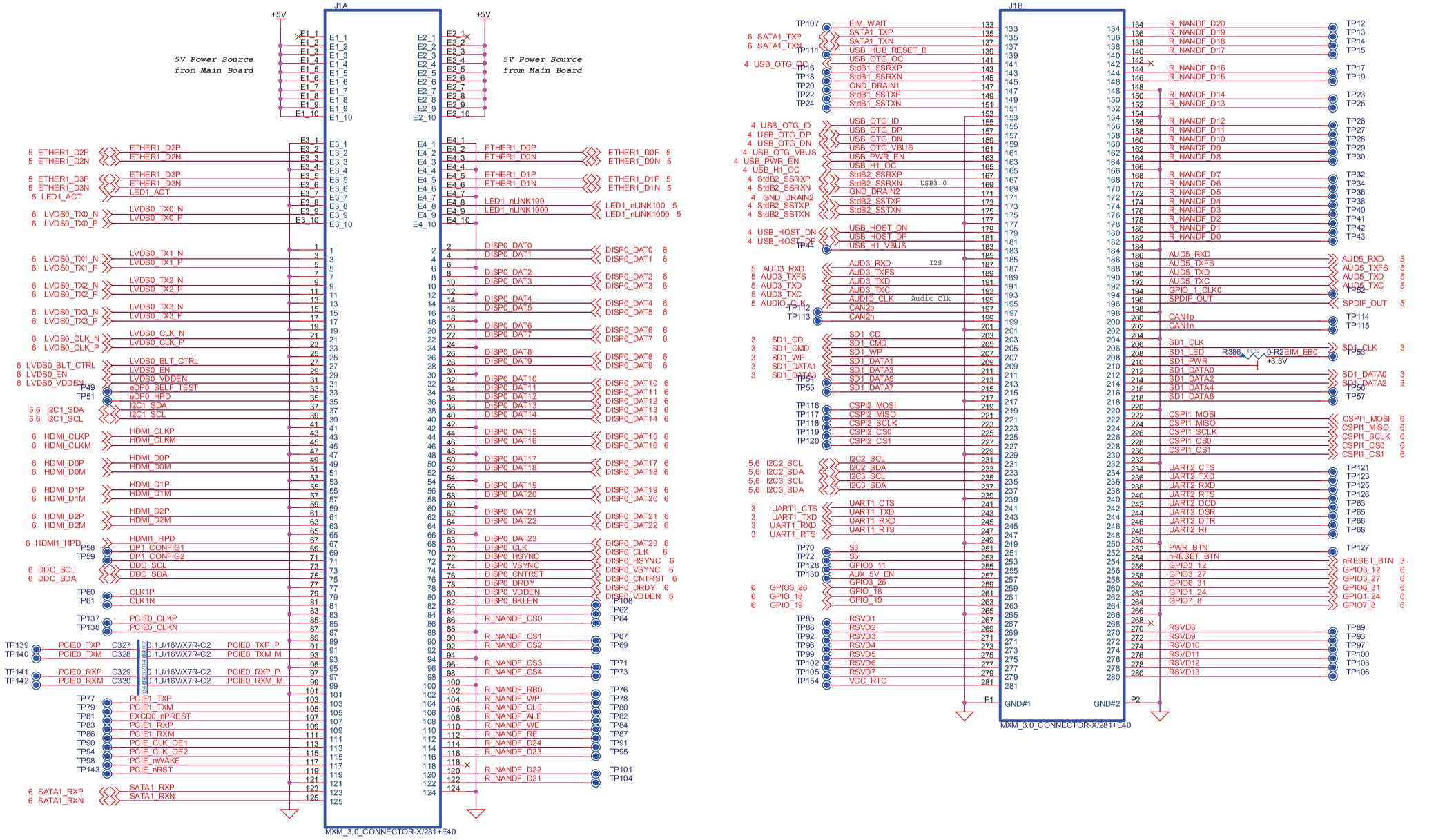


RoHS compliant



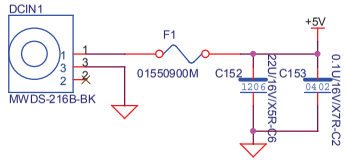
WANDBOARD.ORG		
Title: INDEX		
Size: Custom	Document Number: WAND	Rev: A
Date: Thursday, February 07, 2013	Sheet 1 of 6	

Board to Board

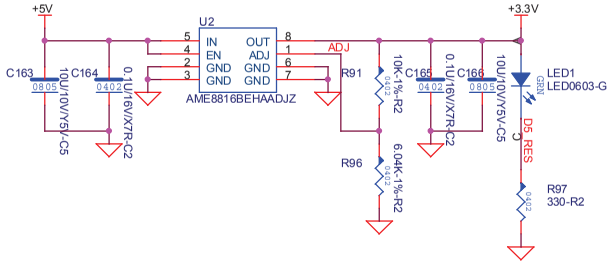


WANDBOARD.ORG		
Title: Board to Board Conn.		
Size: Custom	Document Number: WAND	Rev: A
Date: Thursday, February 07, 2013	Sheet 2 of 6	

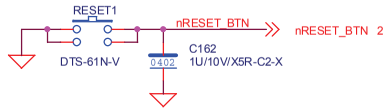
DC JACK



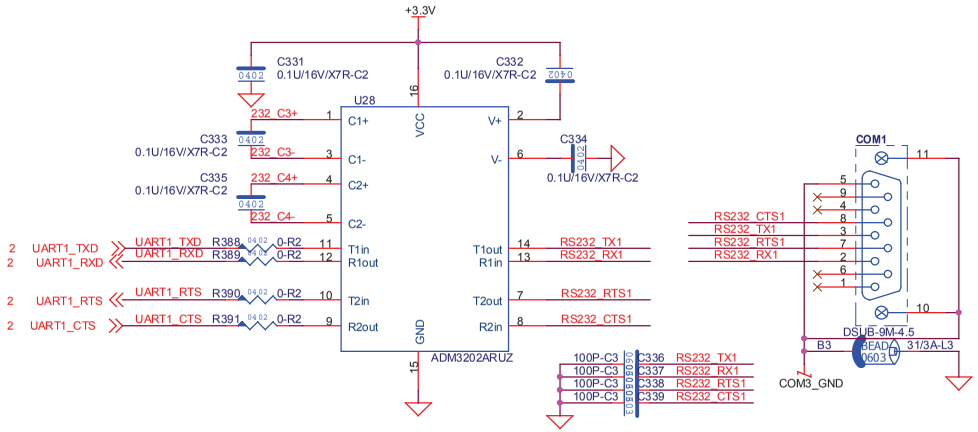
DC-DC



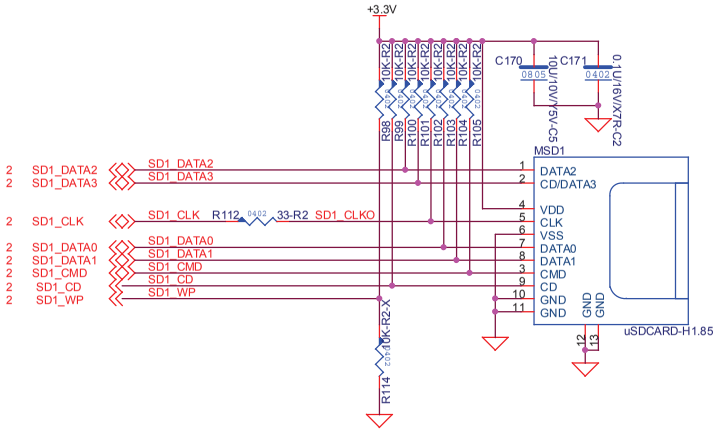
Button



UART

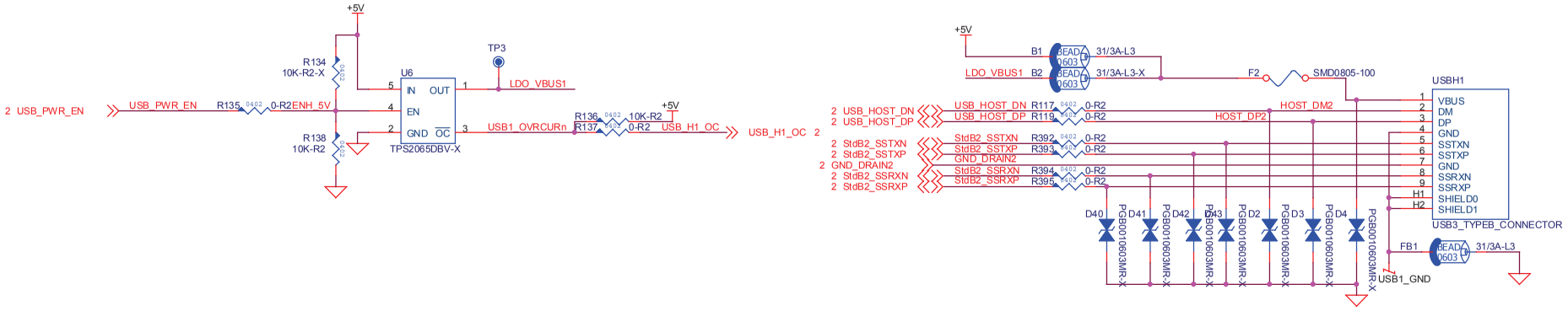


Micro-SD

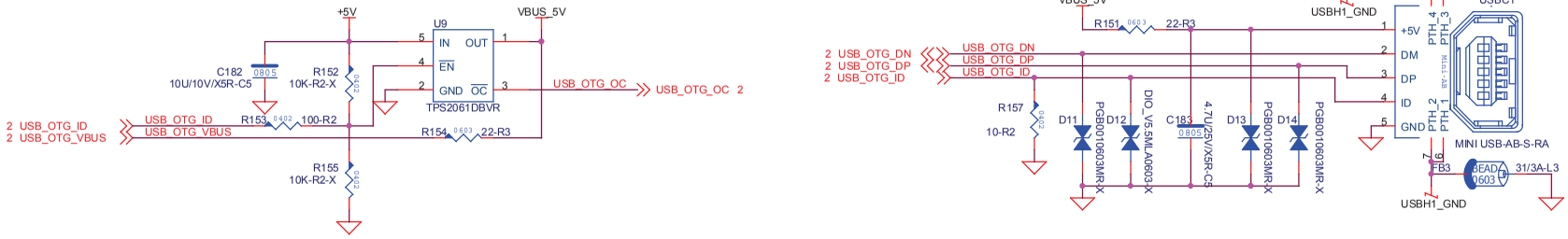


WANDBOARD.ORG		
Title: DC-DC& M-SD & RJ45 &RTC		
Size: Custom	Document Number: WAND	Rev: A
Date: Thursday, February 07, 2013	Sheet 3 of 6	

HOST USB

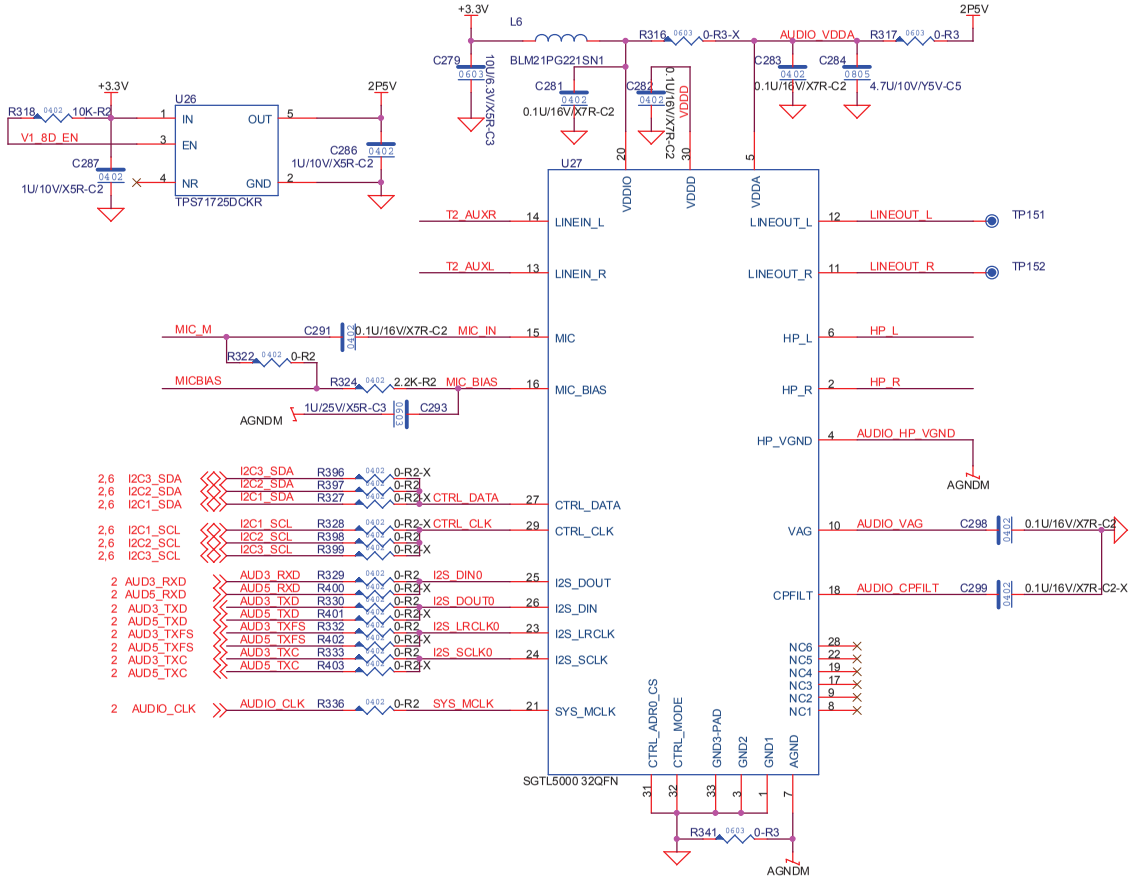


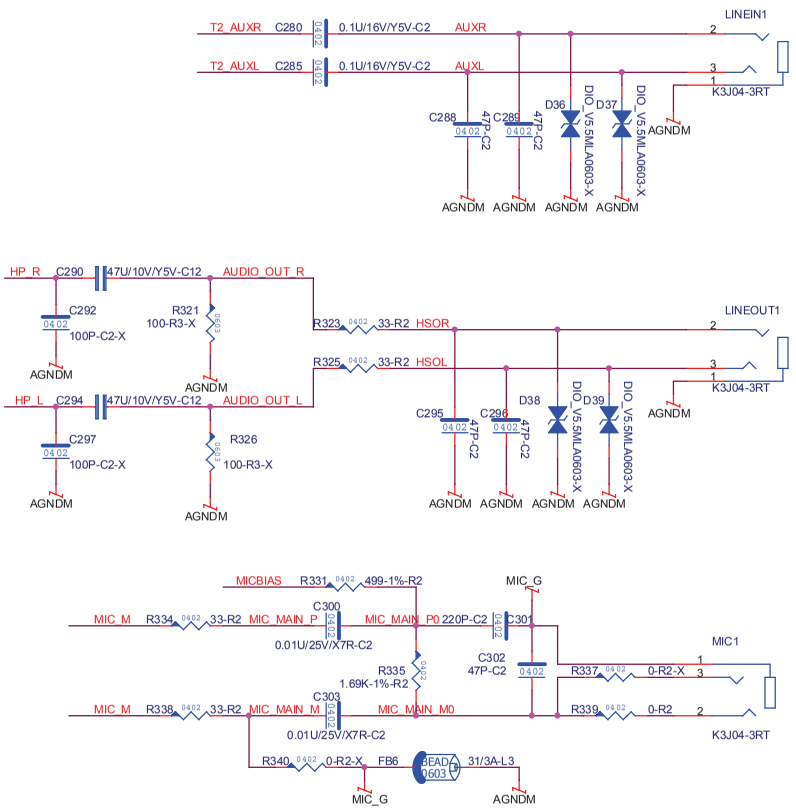
OTG USB



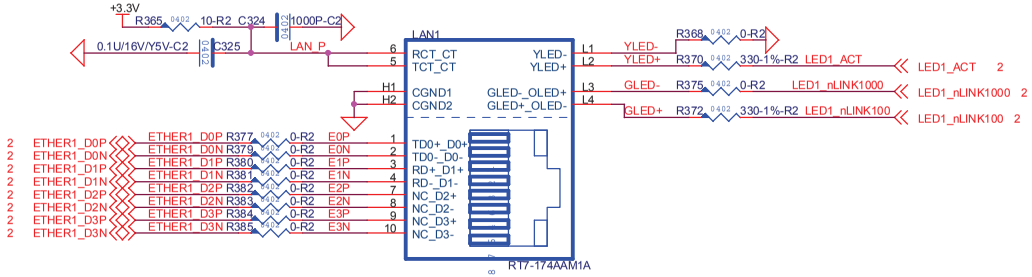
WANDBOARD.ORG		
Title: Host & Client USB		
Size: Custom	Document Number: WAND	Rev: A
Date: Thursday, February 07, 2013	Sheet 4 of 6	

AUDIO

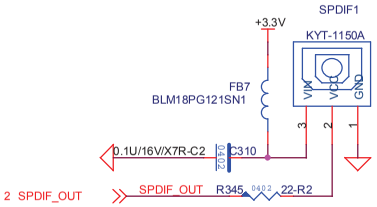




RJ45

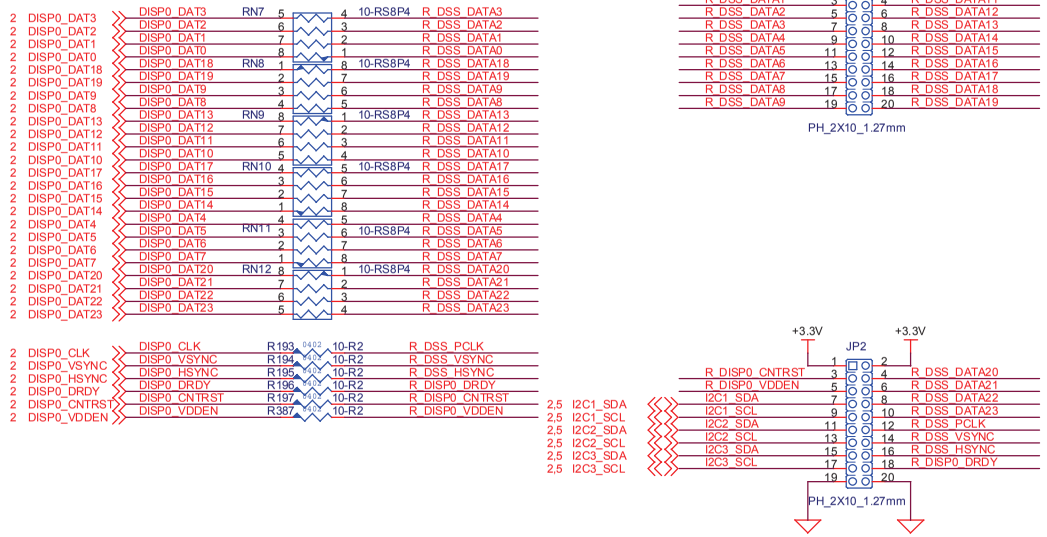


SPDIF

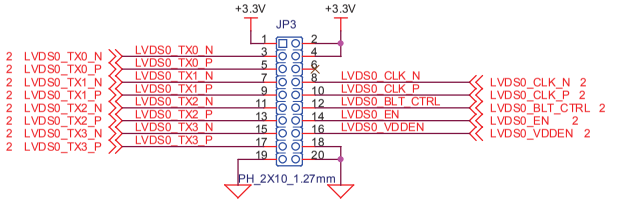


WANDBOARD.ORG		
Title: Audio & Amplifier		
Size: Custom	Document Number: WAND	Rev: A
Date: Thursday, February 07, 2013	Sheet 5 of 6	

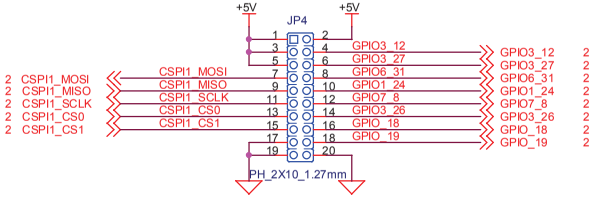
TTL



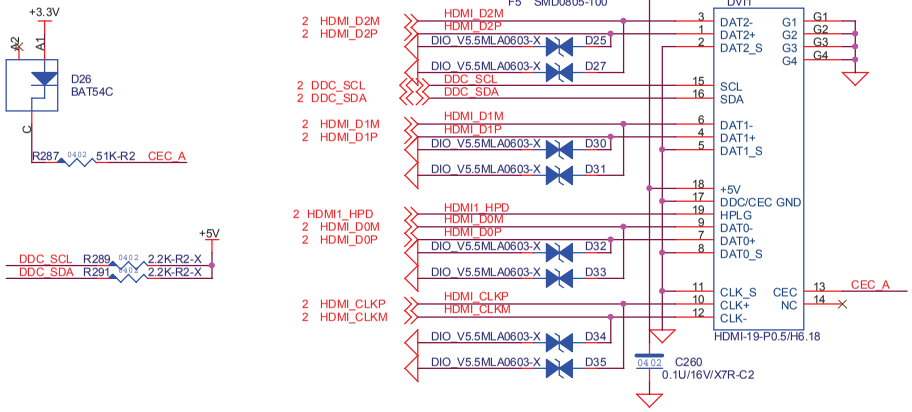
LVDS



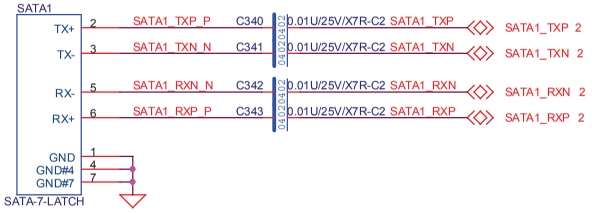
SPI



HDMI



SATA



WANDBOARD.ORG

Title: **LVDS & HDMI & SATA**

Size	Document Number	Rev
Custom	WAND	A
Date: Thursday, February 07, 2013	Sheet 6 of 6	